The Aberdeen Varicose Vein Questionnaire, Patient Factors and Referral for Treatment

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WHAT THIS PAPER ADDS

The mean AVVQ score was found to be 10 points higher in patients with bilateral than with unilateral disease. The distribution of veins (unilateral vs. bilateral) must be adjusted for when reporting AVVQ scores.

Objectives: It has been suggested that the Aberdeen Varicose Vein Questionnaire (AVVQ) could be used to help inform a patient pathway for referral and treatment of varicose veins. We aimed to determine 1) which patient and vein characteristics affected the AVVQ score, and 2) whether scores differed between those who were and were not offered treatment.

Methods: Patients completed the AVVQ at the clinic prior to being seen. Treatment was offered to patients with symptoms, and duplex detected truncal incompetence by surgeons blinded to the score.

Results: A total of 228 consecutive patients completed the AVVQ: 199 were valid questionnaires. On multivariate analysis, factors associated with a worse quality of life were female gender ($p = .034$, 3.14 mean unit increase in AVVQ), and bilateral varicose veins (10.25 unit increase, $p < .001$). For patients with C2 disease, only the presence of bilateral veins was significant. Overall, the AVVQ score was higher in those patients offered treatment than in those who were not (mean 20.3 [SD = 9.9] vs. 17.3 [SD = 10.3], $p = .023$), which equates to a 2.74 unit increase. This was not significant in patients with C2 disease.

Conclusion: It is unlikely that a threshold AVVQ score could be used to aid referral of patients with C2 disease. The distribution of veins (unilateral vs. bilateral) must be adjusted for when reporting AVVQ scores.

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INTRODUCTION

Treatment of varicose veins results in a considerable workload and financial burden to the NHS. Visible varicose veins occur in up to 40% of men and 32% of women, and many patients have impaired quality of life. Treatment of varicose veins has been shown to improve patients quality of life for at least 1 year.[1–7] A randomized controlled trial (RCT) of surgery versus conservative management estimated that the incremental cost per quality-adjusted life year (QALY) for surgery was £4682, with a 70% probability that the cost per QALY would be less than the National Institute for Clinical Excellence (NICE) £20,000 threshold.[8] Endovenous treatments have been shown to improve quality of life and are likely to be more cost-effective than surgery.

Patient-related outcome measures (PROMs) are increasingly used to assess the quality of services provided across the NHS and inform service redesign. From 2009, the Standard NHS Contract for Acute Services in England requires all licensed providers of NHS-funded varicose vein treatment to ask patients to complete PROM questionnaires (before and after surgery). The Aberdeen Varicose Vein Questionnaire (AVVQ) is used as the disease-specific PROM for varicose vein interventions. Data have shown that treatment of varicose veins results in significant improvement in health for patients, with an almost a halving of the AVVQ score compared to preoperative values.[9] Furthermore, patients with the lowest (less severe) pre-treatment scores have been found to benefit least from intervention.

It has been suggested that the AVVQ should be used to help inform a patient pathway for referral and treatment of varicose veins.[10,11] With the increasing use of the AVVQ, it is important to determine which patient factors may influence the score and also importantly if there should be a cut-off value to determine which patients should be offered interventional treatment.

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The aim of this study was to determine the relationship, if any, between the AVVQ scores in patients referred to an open access secondary care varicose vein clinic and gender, clinical grade in the Clinical, Etiologic, Anatomic, Pathophysiological (C) classification and other vein characteristics (primary vs. recurrent; unilateral vs. bilateral; symptomatic vs. asymptomatic; main stem incompetence vs. no main stem incompetence). The unit's policy was to offer patients with symptomatic varicose veins and duplex-detected truncal reflux endovenous treatment when possible. Additionally, we aimed to determine if the AVVQ score in patients who fulfilled the unit's criteria for endovenous treatment was different from those patients who did not.

PATIENTS AND METHODS

A total of 228 consecutive patients who were referred to the open access varicose vein clinic completed the AVVQ at the clinic prior to the appointment with a vascular surgeon (between June and end of October 2012). The local referral policies allowed for all patients with symptomatic varicose veins to be referred for consideration of treatment in accordance with the NICE referral guidelines. The five consultant specialist were blinded to the score. Reflux was defined as the presence of greater than 1-second truncal reflux. Patients with learning difficulties or those who required an interpreter were excluded.

AVVQ

The AVVQs were scored using the method described and validated by Andrew Garratt.[12,13] The total score for the 13 questions ranges from 0 to 100 points, with 0 points indicating the best possible quality of life.

Missing data

Questionnaires in which question 1 or fewer than nine questions were completed were excluded. For patients with unilateral veins, if a patient consistently omitted questions relating to their unaffected leg then the missing answers were assumed to be no/none at all. In all other cases, for omitted questions a negative coefficient was used to distinguish between answers 'no' or 'none at all'. Negative coefficients were summated and their overall value subtracted from the maximum points that can be scored in the AVVQ.

Statistical analysis

Validated AVVQ scores were subsequently analysed with regard to gender, C grade; primary/recurrent; unilateral/bilateral; symptomatic/asymptomatic; main stem incompetence/no main stem incompetence; and whether treatment offered/no treatment offered by a fully trained statistician. SPSS version 20 was used in data analyses. Normality of the data was assessed using graphical methods, including frequency distribution on a histogram and normal Q—Q plot. The Kolmogorov—Smirnov test was used as a confirmation. The Mann—Whitney *U* test was used in the preliminary analysis to determine whether the differences observed were statistically significant as our outcome data: AVVQ have non-normal distribution. The Kruskal—Wallis test was utilized to compare AVVQ scores in a different C grade. The significant variables from univariate analyses were entered in multiple regression analysis to predict AVVQ from identified significant independent variables. All probability tests were two-sided and statistical significance was at $p < .05$.

Table 1. AVVQ score, patient and vein characteristics.

Characteristics		AVVQ score			*p*
		n	Mean	SD	
Gender	Female	142	20.1	9.6	.007
	Male	57	16.9	11.0	
Recurrence	Primary	152	18.8	9.2	.696
	Recurrent varicose veins	47	20.6	12.5	
Location of varicose vein	Unilateral	133	15.9	7.7	<.001
	Bilateral	66	25.9	11.0	
Symptoms	Symptomatic	175	19.8	10.2	0.015
	Asymptomatic	24	14.7	8.2	
Reflux	Truncal reflux	150	20.1	10.3	.023
	No truncal reflux	49	16.4	9.1	
C grade	0	8	11.1	4.8	.072
	1	9	17.3	5.1	
	2	145	19.3	9.3	
	3	6	24.1	16.1	
	>4	31	19.2	10.1	

Note. *n* is the number of patients in each category. Values for *p* obtained using non-parametric (Mann—Whitney U and Kruskal—Wallis) tests as appropriate. AVVQ = Aberdeen Varicose Vein Questionnaire.

RESULTS

A total of 199 out of 228 AVVQs were valid questionnaires. Twenty-seven questionnaires were excluded as the patients did not draw in the presence of varicose veins in question 1, and in a further two questionnaires fewer than nine questions were answered. These patients were excluded from the analysis. The mean (range) age was 49 years (20—86 years), the male to female ratio was 1:2.5, and the mean (standard deviation, SD) AVVQ score for the patients as a whole was 19.2 (SD 10.1) (Table 1). Of note, 17 patients did not have varicose veins (CO/C1) and 24 were either completely asymptomatic or had symptoms which the specialist did not feel were attributed to their varicose veins.

Factors affecting the quality of life in patients with varicose veins

The majority of patients had a C2 (Table 1); only two patients had a higher C grade classification than 4 (C5, $n = 1$; C6 $n = 1$). The AVVQ scores increased in C3 compared with C2, but were similar in C2 and C4 (Table 2). Overall, there was no association between the C grade and the AVVQ score.

On univariate analysis, quality of life was lower in patients presenting with symptomatic than asymptomatic

Table 2. Multivariate regression: Aberdeen Varicose Vein Questionnaire score as the dependent variable.

	Coefficients		95% CI		*p*
	β	Standard error	Lower bound	Upper bound	
Recurrent varicose veins	−0.29	1.54	−3.32	2.74	.849
Bilateral varicose veins	10.25	1.36	7.56	12.94	<.001
Symptomatic	4.28	3.25	−2.13	10.70	.190
Reflux	3.99	2.75	−1.44	9.42	.149
Female sex	3.14	1.47	0.24	6.03	.034

varicose veins ($p = .015$). Patients with bilateral varicose veins had a worse quality of life than those with unilateral varicose veins ($p < .001$). Female gender was associated with a worse quality of life ($p = .007$). Varicose veins associated with truncal reflux (great or small saphenous) had a greater impact on the quality of life than varicose veins not associated with truncal reflux ($p = .023$). No significant difference was found between AVVQ scores in patients presenting with primary and recurrent varicose veins ($p > 0.05$) (Table 1). Patients who had symptomatic varicose veins and main truncal reflux and were offered treatment had a higher mean (SD) AVVQ score than the patients who were not offered any surgical intervention 20.3 (9.9) versus 17.3 (10.3) years ($p = .023$).

On multiple regression analysis female gender and the presence of bilateral varicose veins remained independent factors that predicted the quality of life in patients with varicose veins (Table 2). The presence of recurrent varicose veins, symptomatic varicose veins and truncal reflux were not found to be independent factors that could predict the quality of life (Table 2).

C2

The multivariate analysis was repeated for patients with C2 varicose veins, who made up 73% of the cohort. In this analysis female gender was not significant but the presence of bilateral veins remained significant (Table 3). The mean AVVQ score in the patients who were offered treatment ($n = 96$) was 20.1 (SD 8.7) and those were not offered treatment ($n = 49$) 17.8 (SD = 10.2, $p = .1$).

Table 3. Multivariate regression in the subset of people with CEAP grade 2.

	Coefficients		95% CI		*p*
	β	Standard error	Lower bound	Upper bound	
Recurrent varicose veins	−0.95	1.64	−4.19	2.28	.561
Bilateral varicose veins	8.90	1.51	5.92	11.88	<.001
Symptomatic	2.73	3.94	−5.06	10.52	.489
Reflux	3.29	3.17	−2.96	9.55	.300
Female sex	2.33	1.62	−0.87	5.53	.153

DISCUSSION

The main findings of this study is that the AVVQ score was found to be higher in females and in patients with bilateral veins than with unilateral veins. These factors were independently associated with impaired quality of life. Patients who had symptomatic veins and reflux on duplex scanning were offered intervention with endovenous treatment. The patients who were offered intervention were found to have a significantly poorer quality of life than those who were not.

For the entire cohort, females had a poorer quality of life with a mean increase in AVVQ score of 3.14 units compared with males. However, when patients with C2 were analysed separately no affect for gender on the AVVQ was observed. This is in contrast to the study by Conway et al.,[10] who found that women with C2 and C3 varicose veins have significantly worse quality of life as assessed by the AVVQ than men with similar C grade disease but this was not evident in patients with more severe disease (C4–6).

A novel finding from this series is the influence of whether the veins were unilateral or bilateral on the AVVQ score. There was a mean increase of 10.25 units in the AVVQ score in patients who presented with bilateral varicose veins compared with unilateral veins. This has not previously been documented and the benefit of treatment especially on the AVVQ score if performed only unilaterally or as a staged procedure is not known. It is interesting that despite the surgeons being blinded to the AVVQ score, those patients they offered treatment to had a significantly higher AVVQ score than those who were treated conservatively. This lends support to the proposal for a threshold to guide referral for treatment of varicose veins, especially when the improvement following treatment has been shown to be greatest in those with the worst quality of life.[9] However, it can be seen that there was a considerable overlap in the range of AVVQ score in those who were and were not offered treatment. Furthermore, an analysis of patients with C2 score showed a non-significant increase in the AVVQ score in those who were offered compared to who were not offered treatment. This is probably because treatment was more likely to be offered to patients with more severe disease. These are important findings which need to be considered if the AVVQ is to be used to assess the quality of services provided across the NHS and inform service redesign. It is also of note that in this study, 11% of questionnaires had to be excluded as they were not appropriately completed by the patient.

In this study, a number of other factors, such as presence of symptoms, recurrent veins and presence of reflux were significant on univariate but not multivariate analysis. Previously, only weak correlations have been noted between the AVVQ and anatomical reflux.[15] Similarly, Conway et al.[10] found no associations between the AVVQ and symptoms. Patients may feel that in the current economic climate that they would not be offered treatment for cosmetic reasons and thus the presence or absence of symptoms may be influenced by other factors. We did not find any statistical

difference between the C-grade and AVVQ. However, it can be seen that the score was higher in C3 than C2 but not in C4. Our findings are in contrast to two previous studies which showed a correlation between the AVVQ and the clinical grading of varicose veins as assessed by the C grade.[11,14]

CONCLUSIONS

The AVVQ was not higher in patients with C2 disease who were offered intervention than in those who were not. It is unlikely that a threshold could be used to aid referral of patients with C2 disease. The distribution of veins (unilateral vs. bilateral) must be adjusted for when reporting AVVQ scores.

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CONFLICT OF INTEREST

None.

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